Comal ISD
Course Syllabus
Canyon Lake High School
Year 2013-2014

Grading guidelines and shared responsibilities, attendance and behavior expectations, and essential curriculum standards for the course

Course Title: ***Introduction to Agriculture Mechanics and Metal Fabrication***
Teacher: ***Gary W. Adams***
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Office Hours: 7:00 am – 8:00 am 8:30 am – 9:25 am
Mechanics Laboratory hours: 4:00 pm – 6:30 pm on Wednesday afternoons and all class times.

Grading Guideline:

Six-Weeks Grades are determined in the following manner:

1. 20% Daily Grades
   a. Homework papers
   b. Online assignments
   c. Daily Work
2. 35% Quizzes and CAs
   a. Quizzes
   b. Warm-ups
3. Major Grades
   a. Exam or test
   b. Welding Skill Grades
   c. Projects assigned.

Semester Grades:

1st Six Weeks Average = 30%
2nd Six Weeks Average = 30%
3rd Six Weeks Average = 30%
Semester/Final Exam = 10%

Students will get a grade for every day they are in the shop/laboratory

a. Doing your work and cleaning up will result in a deduction.
b. Failing to clean up is 30-point deduction minimum.
c. Horse play is a zero for the day
d. Not being on time to the lab is a deduction of 10 points
e. Inappropriate clothing for shop class will result in a **zero for the day.**
   i. Examples: Sandals, shorts, T-shirts, Low neck shirts, dresses and skirts.

Late Work

The table below represents the **maximum** penalty that may be imposed for turning in late work:

Days Late	**Percent of Grade Received by Student**	**Example(s)**
1 Day	80%	100 records as 80 (100 x 0.80 = 80) 80 records as 64 (80 x 0.80 = 64) 60 records as 48 (60 x 0.80 = 48)
2 Days	60%	100 records as 60 (100 x 0.60 = 60) 80 records as 48 (80 x 0.60 = 48) 60 records as 36 (60 x 0.60 = 36)
3 or more Days	0%	No credit given—grade of zero (0)

****Calendar days do not include Saturdays and Sundays***

- More than three late assignments during any one six-week grading period may result in additional consequences.
- Extenuating circumstances may occur that are out of the control of the student and which prevent him/her from completing and returning homework assignments. The student is to inform the teacher of any such circumstances that prevented the completion of the homework. Teachers may grant exceptions to this policy, as necessary.
- The late work policy may not apply to projects and term papers that are scheduled in advance and can be turned in prior to an absence.

Makeup Work

In order to provide the total assessment "picture" of a student's academic progress for a course, any student missing classroom instruction should be given the opportunity to make up the missing assigned work. This will ensure instructional continuity and place importance upon consistent attendance and daily study. Students shall be permitted to make up assignments and tests following any absence.

Makeup Work Guidelines

- Makeup work is available to all students. **Students are responsible for asking teachers** for the makeup work upon returning to class. Students shall receive credit for satisfactory makeup work after an absence**, but may receive a zero for any test not made up within the allotted time**. Any assignment not turned in within the allotted time falls within the late work guidelines.
- **The number of class days allowed for makeup work to be completed for full credit will be equal to the number of times a class was missed.** Extra time may be given at the teacher's discretion.
- A student should not, on the day of returning to school, be required to take a quiz or test that was announced during his/her absence.
- Makeup work, including tests, may be an alternate version to assess what the student has learned.
- Teachers may assign additional work to ensure that students who have been absent have sufficient opportunity to master the TEKS or to meet subject or course requirements. The assignments shall be based on the instructional objectives for the subject or course and may provide greater depth of subject matter than routine makeup work.

Suspension

A student suspended from his/her regular classes is to request makeup work when he/she returns to school. The student is expected to satisfactorily complete the assignments for the period of suspension within the time designated by the makeup work policy.

Exam Exemptions

Beginning with the 2013-2014 school year, no exemptions will be allowed at the middle or high school.

CLASSROOM EXPECTATIONS

1. BE PREPARED
    a. Be here on time.
    b. Read the board.
    c. Bring ALL materials to class EVERYDAY.
    d. Turn in assignments on time.
2. ACT APPROPIATELY
    a. Follow directions.
    b. Stay on task.
    c. Show respect for others.
    d. Participate.
    e. Obey all school rules.

Materials and Class Actives Common to all Agriculture classes:

1. Note Book
2. Dividers for Six Weeks
3. Pens and Pencils
4. Daily Log of what happens in class – This paper will be provided
5. Keeping a Record Book electronically (provided & can be access from home.

CONDUCT POLICY IN THE CLASSROOM:

1. No food or drinks will be consumed in the class room after the bell.
2. Use of inappropriate language or gestures will result in a referral.
3. Tardiness will result in a 5 point deduction from the daily grade.
4. Students will be in their seats and not in the shops, labs or in the bathrooms at the time of the tardy bell.
5. Students should request permission to go to the bath room or to get a drink during the class time.
6. Do not leave books, clothing or any other items on desk, tables without permission.
    a. Items will be placed in lost and found at school.

Classroom disruptions or other infringements on the class will be dealt with individually.

Consequences can include: Verbal warning, Detention, Parental Contact, and Administrative Referral

Course Description of AGSCI Horticulture Plant Production

The course will develop understanding and skills in the traditional areas of Horticulture Science of Growing, caring and propagation of plants in a greenhouse was well as the types of greenhouse used and their maintenance. Supervised experience and FFA will be integrated, as appropriate throughout.

UNIT A: EMPLOYABILITY CHARACTERISTICS OF A SUCCESSFUL WORKER IN THE MODERN WORKPLACE

Topic A-1: Career Development Relating to Entrepreneurship and Employment Opportunities

Topic Goal: The student shall be provided the opportunity to discuss career and entrepreneurship opportunities in agriculture-related occupations and the characteristics and skills demonstrated by effective employees and employers.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. examine the elements and advantages of the free enterprise system;
2. explain the role of a small business in the free enterprise system;
3. discuss factors that motivate entrepreneurs and self-employment;
4. identify characteristics of a successful entrepreneur;
5. identify opportunities for business ownership;
6. explain the risk and profit motive factor;
7. explain the importance of the application of organizational policies and procedures;
8. identify ethical practices and responsibilities;
9. discuss career opportunities in agricultural related occupations and the need for continued education for advancement;
10. identify effective methods to secure and terminate employment;
11. demonstrate effective written and oral skills;
12. follow through on assigned tasks;
13. demonstrate dependability and punctuality;
14. demonstrate productive work habit and attitude;
15. develop pride in the quality of work performed;
16. recognize the dignity of work;
17. develop skills in planning and organizing work;
18. apply required methods and sequences when performing tasks; and
19. apply principles of time management and work simplification when performing assigned tasks.

Topic A-2: Resource Allocation Suggested Hours of Instruction:

Topic Goal: The student shall be provided the opportunity to discuss factors involved in evaluating and allocating resources, and to demonstrate the consideration of these factors in completing tasks.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. select relevant goal-related activities and rank them in order of importance;
2. allocate time to activities;
3. understand, prepare, and follow schedules;
4. prepare and use budgets including making cost and revenue forecasts;

5. maintain detailed records and track budget performance for analysis and adjustment when appropriate;
6. acquire, store, and distribute goods and resources in order to make best use of them;
7. assess knowledge and skills, and distribute work load accordingly; and
8. evaluate performance and provide feedback.

Topic A-3: Information Processing Suggested Hours of Instruction:

Topic Goal: The student shall be provided the opportunity to demonstrate knowledge and skills in using various technologies to obtain, process, and distribute information.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. identify need for data, obtain it from existing sources, or create it and evaluate its relevance and accuracy;
2. organize, process, and maintain written or computerized records and other forms of information in a systematic fashion;
3. select and analyze information and communicate the results to others using oral, written, graphic, pictorial, or multi-media methods in industry-appropriate terminology;
4. employ computers to acquire, organize, analyze, and communicate information; and
5. utilize appropriate mathematical operations.

Topic A-4: Interpersonal Relations

Topic Goal: The student shall be provided the opportunity to discuss interpersonal skills require of co-workers, and to demonstrate the use of those skills in the learning environment.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. work cooperatively with others and contribute to the group with ideas, suggestions, and effort;
2. help others learn;
3. work and communicate with clients/customers to satisfy their expectations;
4. communicate thoughts, feelings, facts, and ideas to justify a position, encourage, persuade, convince, or otherwise motivate individuals and groups including responsibly challenging existing procedures, policies, and authority;
5. negotiate an agreement that may involve exchanging specific resources or resolving divergent interests; and
6. recognize concepts related to cultural diversity, and work well with others regardless of their age and ethnic, social, or educational backgrounds.

Topic A-5: Social, Organizational, and Technological Systems

Topic Goal: The student shall be provided the opportunity to discuss the interaction and function of social, organizational, and technological systems.

Topic Objectives:

After completing the topic(s), the student shall be able to:.

1. distinguish trends, predict impact of actions on system operations, diagnose deviations in the function of the system/organization, and take necessary action to improve performance; and
2. make suggestions to modify existing system(s) to improve products or services, and develop new or alternative systems.

Topic A-6: Selection and Application of Technology

Topic Goal: The student shall be provided the opportunity to identify factors to consider when evaluating, adopting, and using new and emerging technologies.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. determine which set of procedures, tools, machines, including computers and their programs, and other technologies will produce the desired results;
2. apply the proper procedures for setting up and operating appropriate technologies;
3. examine the benefits of adopting new technology in agricultural applications; and
4. prevent, identify, and solve problems in using machines, computers, and other technologies

Topic A-7: Personal and Occupational Safety Practices in the Workplace

Topic Goal: The student shall be provided the opportunity to demonstrate knowledge and skills of applicable safety policies and procedures.

Topic Objectives:

After completing the topic(s), the student shall be able to:

5. locate sources of information regarding relevant safety policies and regulations;
6. identify proper safety procedures; and
7. apply safe working practices to all training/working situations.

Topic A-8: Supervised Agricultural Experience Activities

Topic Goal: The student shall be provided the opportunity to discuss the importance of supervised agricultural experience programs.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. identify types of supervised agricultural experience activities;
2. describe characteristics of successful supervised agricultural experience programs;
3. select, plan, and conduct supervised agricultural experience activities; and
4. prepare and maintain accurate management and accounting records.

UNIT B: CLASSIFY AND IDENTIFY PLANTS USED IN HORTICULTURAL PLANT PRODUCTION

Topic B-1: Identify Advantages of Naming Plants Scientifically

The student shall be provided the opportunity to name plants scientifically as a means of classifying and identifying plants.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. explain the importance of scientific plant names;
2. identify the genus name and the species name in a scientific name;
3. describe plant characteristics that scientific plant names may describe;
4. explain the advantages of naming plants scientifically; and
5. write and use scientific plant names correctly.

Topic B-2: Recognize Plant Characteristics Used to Classify, Identify, and Name Plants

Topic Goal: The student shall be provided the opportunity to classify, identify, and name plants by recognizing their unique characteristics.

Topic Objectives: After completing the topic(s), the student shall be able to:

1. identify the levels and categories of the plant kingdom hierarchy in the proper order;
2. define an annual, biennial, and perennial based on plant life cycle classification;
3. identify trees, shrubs, and vines based on growth habit classification;
4. Identify the plants on the State and National Nursery Contest
5. classify plants based on size classification;
6. describe the shapes of plants based on form classification;
7. distinguish between deciduous and evergreen plants based on foliage retention classification;
8. determine leaf arrangement on a plant stem;
9. identify leaf venation patterns;
10. recognize the complexity of leaves;
11. identify leaf shapes;
12. recognize the characteristics of leaf margins;
13. determine the presence or absence of surface features on plant leaves;
14. identify the parts of a flower;
15. describe the function of each part of a flower;
16. recognize flower inflorescences;
17. identify buds on a plant stem;
18. distinguish between terminal buds, axillary buds, and fruit buds; and
19. recognize external stem modifications and internal pith characteristics used to identify and classify plants.

Topic B-3: Classify and Identify Greenhouse and Nursery Plants

Topic Goal: The student shall be provided the opportunity to identify various types of greenhouse and nursery plants that are cultivated in the horticulture industry.

Topic Objectives: After completing the topic(s), the student shall be able to:

1. identify greenhouse crops produced for cut flowers;
2. recognize greenhouse crops produced as potted flowering plants;
3. identify bulb crops produced for their flowers;
4. recognize a variety of tropical foliage plants;
5. identify cultivars of plants produced as bedding plants; and
6. recognize a variety of ornamental trees, shrubs, vines, ground covers, and herbaceous perennials produced as nursery crops.

UNIT C: RECOGNIZE PLANT PROPAGATION TECHNIQUES RELATED TO HORTICULTURAL PLANT PRODUCTION

Topic C-1: Identify Vegetative Plant Structures and Their Functions

Topic Goal: The student shall be provided the opportunity to identify the structures and functions of plant cells, tissues, roots, stems, and leaves.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. describe the structure and function of plant cells and tissues;
2. identify the structure and function of plant roots;
3. describe the structure of plant stems and discuss their function;
4. identify examples of plant stem modifications;
5. describe the structure and functions of plant leaves;

6. label the parts of a simple leaf and a compound leaf; and
7. identify examples of modified leaves.

Topic C-2: Identify Reproductive Plant Structures and Their Functions

Topic Goal: The student shall be provided the opportunity to identify the structures and functions of reproductive plant structures.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. identify the structures and functions of flowers; and
2. describe the structures and functions of seeds and fruits.

Topic C-3: Recognize Plant Physiological Processes

Topic Goal: The student shall be provided the opportunity to become familiar with the plant physiological processes of transpiration, photosynthesis, translocation, respiration, and reproduction.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. describe the process of transpiration and its importance to plant growth;
2. recognize the importance of photosynthesis and how it affects plant growth;
3. explain the process of translocation and its occurrence within plants;
4. describe the importance of respiration and its effect on plant growth; and
5. explain the importance of pollination and fertilization and their roles in the process of plant reproduction.

Topic C-4: Germinate and Transplant Seeds Suggested Hours of Instruction:

Topic Goal: The student shall be provided the opportunity to germinate seeds and transplant seedlings.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. identify the parts of a seed;
2. differentiate between monocot and dicot seeds;
3. describe the factors that influence seed germination;
4. distinguish between seed stratification and seed scarification;
5. describe the steps in the germination process;
6. distinguish between epigeous, hypogeous, and monocot germination;
7. describe the growing medium requirements for germinating seeds;
8. discuss the aspects of planting seeds outdoors and in the greenhouse;
9. identify seedbeds and containers;
10. explain the importance of transplanting seedlings from seedling flats;
11. describe the process of properly transplanting seedlings;
12. explain the importance of hardening-off seedlings; and
13. practice methods of properly transplanting seedlings from seedling flats into larger containers.

Topic C-5: Propagate Plants Asexually

Topic Goal: The student shall be provided the opportunity to become familiar with the methods that are used to propagate plants asexually.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. define asexual propagation;
2. describe the advantages of propagating plants asexually;
3. describe a cutting;
4. identify stem cuttings, root cuttings, leaf-bud cuttings, and leaf cuttings;

5. describe the advantages of layering as a means of asexual plant propagation;
6. identify various methods of ground and air layering;
7. identify methods of separation and division used to asexually propagate plants;
8. describe grafting and its advantages;
9. identify the scion and rootstock of a grafted plant;
10. identify various forms of grafting;
11. differentiate between grafting and budding;
12. identify patch budding, T-budding, and chip budding;
13. describe tissue culture;
14. demonstrate and perform various methods of asexual propagation;
15. explain the uses of rooting hormones for asexually propagating plants;
16. describe the characteristics of rooting media used in asexual propagation; and
17. describe the environmental conditions that affect the success of asexual propagation.

UNIT D: IDENTIFY STRUCTURES AND EQUIPMENT USED IN HORTICULTURAL PLANT PRODUCTION

Topic D-1: Select Structures and Equipment for Growing Horticultural Plants

Topic Goal: The student shall be provided the opportunity to become familiar with the types of structures and with the types and requirements of environmental control equipment that are used in the production of horticultural crops.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. list several factors that influence the size of greenhouses that are used to produce horticultural crops;
2. describe the types and uses of greenhouses;
3. label the parts of an even span greenhouse;
4. discuss the purposes of coldframes;
5. explain the use of hotbeds in the production of horticultural crops;
6. describe why lathhouses are useful for container-grown nursery plants;
7. explain how to use hot caps on field plants;
8. explain the operation of a wet-pad exhaust fan cooling system;
9. determine the adjusted air flow rate for cooling a greenhouse with a wet-pad exhaust fan cooling system;
10. select equipment for a wet-pad exhaust fan cooling system;
11. explain how to design a greenhouse for the best air flow patterns and uniform distribution;
12. describe the operation of a fan-jet ventilation system;
13. select equipment for a fan-jet ventilation system;
14. calculate greenhouse heating requirements; and
15. select greenhouse heating equipment.

Topic D-2: Evaluate Considerations for Locating and Building Structures for Growing Horticultural Plants

Topic Goal: The student shall be provided the opportunity to become familiar with the factors to consider when planning and selecting a location for a greenhouse or nursery production business.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. identify the land characteristics to consider when planning the location of a horticultural plant production facility;
2. discuss the importance of available utilities and water for horticultural crop production;

3. describe why climatic conditions should be considered when selecting a site for a greenhouse or nursery crop production facility;
4. explain how to orient a greenhouse in order for it to receive the most available sunlight for efficient plant production year round;
5. describe several economic factors to be considered when establishing a greenhouse or nursery operation;
6. identify zoning and tax laws that affect the building and operation of a greenhouse or nursery facility;
7. determine initial and operating costs incurred in establishing a greenhouse or nursery operation; and
8. describe why personal preference is an important consideration when selecting a site for a horticultural plant production facility.

Topic D-3: Identify and Utilize Hand and Power Tools and Equipment Used in Horticultural Plant Production

Topic Goal: The student shall be provided the opportunity to learn the proper use and maintenance of tools and equipment used in horticultural plant production.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. identify, maintain, and store hand tools;
2. identify, maintain, and store small power tools; and
3. identify, maintain, and store large power equipment.

Topic D-4: Maintain Structures and Equipment Used in Horticultural Plant Production

Topic Goal: The student shall be provided the opportunity to become familiar with the major considerations to be made in order to properly maintain greenhouse structures and equipment.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. explain the purpose of a preventive maintenance program for greenhouse structures and equipment;
2. discuss how to treat and paint wood, metal, or aluminum alloy structures;
3. describe the factors to consider when selecting a covering material;
4. explain how to service and maintain exhaust fans;
5. explain how to service and maintain cooling pad systems; and
6. explain how to service and maintain unit heaters.

UNIT E: APPLY SAFE WORK PRACTICES IN HORTICULTURAL PLANT PRODUCTION

Topic E-1: Recognize Personal Safety Measures

Topic Goal: The student shall be provided the opportunity to gain an awareness of personal safety measures that apply to horticultural plant production.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. name several factors to be considered in developing good personal safety habits;
2. describe ways to avoid unsafe conditions and prevent unsafe actions;
3. describe the proper techniques for safely handling and lifting materials; and
4. explain the importance of dressing appropriately and wearing protective clothing when performing certain tasks.

Topic E-2: Use Safety Practices in Selecting, Applying, Storing, and Disposing Chemicals

Topic Goal: The student shall be provided the opportunity to develop an awareness of the safety practices that apply to selecting, applying, storing, and disposing chemicals.

Topic Objectives:

After completing the topic,(s) the student shall be able to:

1. recognize the importance of reading safety labels on chemical products;
2. identify signal words on the labels of chemicals that indicate chemical toxicity;
3. describe the guidelines for handling and mixing chemicals;
4. describe the guidelines for storing and disposing chemicals; and
5. recognize the proper procedures for disposing of unused chemicals and empty chemical
6. containers.

Topic E-3: Use Safety Practices in Selecting, Operating, and Maintaining Tools and Equipment

Topic Goal: The student shall be provided the opportunity to develop an awareness of the safety practices that apply to selecting, operating, and maintaining hand tools, small power tools, and large equipment.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. describe common causes of hand tool injuries;
2. describe safety precautions for using hand tools;
3. explain the proper safety precautions for using electrical and gasoline power tools;
4. describe safety precautions that apply when working with or near large power tools and equipment; and
5. recognize measures of first-aid treatment for minor injuries.

UNIT F: RECOGNIZE THE REQUIREMENTS FOR GROWING HORTICULTURAL PLANTS

Topic F-1: Select and Mix Growing Media Components

Topic Goal: The student shall be provided the opportunity to select and mix growing media components.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. Define growing medium;
2. describe the functions of a plants growing medium;
3. describe the advantages of using soilless media;
4. identify the physical and chemical properties of growing media;
5. identify organic and inorganic components of growing media and describe the functions of each;
6. mix growing medium components together to create a plant growing medium; and
7. compare various types of commercially available growing media.

Topic F-2: Prepare Mulches and Compost Suggested Hours of Instruction:

Topic Goal: The student shall be provided the opportunity to identify and prepare mulches and compost.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. discuss the uses and benefits of mulches;
2. identify various types of organic and inorganic mulching materials;
3. use mulches in planting areas;
4. recognize compost and describe its importance in horticultural plant production;
5. describe the advantages and disadvantages of using compost; and

6. construct and use a compost pile.

Topic F-3: Sterilize Plant Growing Media

Topic Goal: The student shall be provided the opportunity to become familiar with the methods of sterilizing plant growing media.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. explain the importance of sterilizing plant growing media;
2. describe methods of using steam to pasteurize and sterilize plant growing media;
3. demonstrate how an electric soil pasteurizer is used for baking plant growing media;
4. prepare growing media for heat pasteurization and sterilization;
5. describe the use of chemicals to sterilize soil and plant growing media; and
6. discuss several considerations for preparing soil and growing media for chemical sterilization.

Topic F-4: Identify and Select Plant Containers Suggested Hours of Instruction:

Topic Goal: The student shall be provided the opportunity to become familiar with the common types of plant containers used in horticultural plant production.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. compare similar features among containers used as plant containers;
2. describe the features of clay and plastic containers and the advantages and disadvantages of using each type as plant containers;
3. differentiate between standard, azalea, and pan sizes of round containers;
4. identify the various types of peat and plastic containers used in bedding plant production; and
5. identify container types used for hanging plants and nursery plants.

Topic F-5: Select and Grow Horticultural Plants

Topic Goal: The student shall be provided the opportunity to become aware of the requirements for selecting and growing greenhouse and nursery crops.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. discuss the cultural requirements for growing cut flowers;
2. identify the cultural requirements for growing potted flowering crops;
3. describe the cultural requirements for growing bedding plants;
4. identify the cultural requirements for growing foliage plants;
5. explain the cultural requirements for growing cacti and succulents;
6. identify the cultural requirements for growing plants for hanging baskets;
7. discuss the cultural requirements for growing nursery stock in field soils; and
8. describe the cultural requirements for growing nursery stock in containers.

Topic F-6: Fertilize Horticultural Plants

Topic Goal: The student shall be provided the opportunity to recognize plant nutrition requirements and apply fertilizers properly.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. explain why fertilizing greenhouse and nursery plants is important;
2. name the primary, secondary, and micronutrients that are required for plant growth;

3. determine the availability of nutrients and the need for fertilization;
4. distinguish among the various fertilizer classifications;
5. identify methods of applying fertilizers to horticultural crops;
6. identify the factors which determine the rate and frequency of fertilizer application;
7. calculate fertilizer solutions;
8. identify the factors to consider when selecting a fertilizer; and
9. apply fertilizer to greenhouse and nursery crops.

Topic F-7: Water Horticultural Plants

Topic Goal: The student shall be provided the opportunity to develop an awareness of the role of water in plant growth and to learn the methods of watering greenhouse and nursery crops.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. describe the function of water in plant growth and development;
2. recognize the effects that water has on plants;
3. determine the frequency for watering plants;
4. determine when to water plants;
5. discuss water quantity and quality; and
6. identify methods of irrigation.

Topic F-8: Manage Pests of Horticultural Plants

Topic Goal: The student shall be provided the opportunity to identify and control insects and diseases which attack greenhouse and nursery crops.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. identify types of insects and insect-like creatures that attack greenhouse and nursery crops;
2. identify methods of controlling insect pests;
3. recognize the symptoms of diseases that attack greenhouse and nursery crops;
4. identify methods of controlling disease organisms;
5. define and identify weeds and the ways to control them; and
6. recognize several types of pesticide formulations.

UNIT G: IDENTIFY AND MANAGE THE ENVIRONMENTAL CONDITIONS REQUIRED IN HORTICULTURAL PLANT PRODUCTION

Topic G-1: Control the Environmental Conditions of Horticultural Plants

Topic Goal: The student shall be provided the opportunity to develop an awareness of the fundamental principles of the environment and the methods used to control the environment of horticultural plants.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. discuss the "greenhouse effect" and the effects that temperature has on plant growth;
2. explain the effects of humidity on plant growth and the importance of properly maintaining the relative humidity inside a greenhouse;
3. properly use thermometers and thermostats to monitor greenhouse temperature;
4. describe methods of greenhouse cooling;
5. describe methods of greenhouse heating;
6. explain the importance of ventilation for controlling greenhouse humidity; and
7. describe the methods that are used for ventilating greenhouses.

Topic G-2: Provide Light and Shade for Horticultural Plants

Topic Goal: The student shall be provided the opportunity to gain an awareness of the lighting requirements of greenhouse and nursery plants as well as the effects of shade on plant production.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. describe how light quality, quantity, and duration affect plant growth;
2. identify the types of lamps that are used for providing supplemental lighting in horticultural plant production areas; and
2. explain the effects and methods of shading greenhouse and nursery plants.

UNIT H: DEVELOP CROP SCHEDULING AND MARKETING TECHNIQUES RELATED TO HORTICULTURAL PLANT PRODUCTION

Topic Goal: The student shall be provided the opportunity to develop crop scheduling techniques for greenhouse and nursery plant production.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. discuss the importance of crop scheduling;
2. prepare production schedules for various types of greenhouse crops; and
3. develop production schedules for various types of nursery crops.

Topic H-2: Identify Factors Involved in the Marketing of Horticultural Plants

Topic Goal: The student shall be provided the opportunity to develop marketing techniques related to horticultural plant production.

Topic Objectives:

After completing the topic(s), the student shall be able to:

1. describe the importance and need for controlling inventory;
2. identify methods of storing crops before sale;
3. identify methods of shipping crops; and
4. describe marketing techniques for selling greenhouse and nursery crops.